



Effects of ginkgo on platelet function in diabetes

Ginkgo biloba is primarily known for its benefits on mental function and the cardiovascular system, but recent research has revealed several new potential applications for this phytomedicine .

Vascular disease and secondary conditions such as retinopathy and glomerulonephropathy are common complications of long term diabetes. As these are associated with small blood vessel occlusions and often platelet hyper-reactivity, investigations into the potential effects of ginkgo on platelet function in diabetes mellitus are warranted.

Reduced platelet aggregation has previously been observed following three months ginkgo ingestion by both non-diabetic and type 2 diabetic subjects⁽¹⁾. While antagonism of platelet activating factor (PAF) has been widely reported as contributing to these anti-platelet effects, the clinical significance of this as a mechanism of anti-platelet activity for ginkgo has recently been challenged^(2,3). No effects on PAF-mediated platelet aggregation were measured during this study, and other mechanisms of antiplatelet action were implicated. These include a nonselective inhibition of cyclooxygenase-1 (COX-1) mediated thromboxane a(2) in platelets and COX-2-mediated prostaglandin PGI(2) production by the endothelial cells, and perhaps platelet-enriched levels of arachidonic acid or COX-1 activity, or both⁽¹⁾.

Further findings by the same investigators into the effects of ginkgo on platelet function in diabetes were published in the April issue of *Diabetes Research in Clinical Practice*⁽⁴⁾. This reported a reduction in platelet malondialdehyde-thiobarbituric acid reacting substances (TBARS) in type 2 diabetic patients with both normal or high cholesterol levels, indicating reduced platelet hyperactivity as well as antioxidant activity. These effects were not associated with a change in platelet counts, but rather inhibition of cyclooxygenase (COX)-1 catalysed arachidonic acid oxygenation, or a reduction in the arachidonic acid pool by ginkgo flavonoids⁽⁴⁾.

Taiwanese researchers have reported improvement in haemorrhological

parameters following 3 months administration of ginkgo to 25 diabetes patients with retinopathy. These benefits included a significant reduction in blood viscosity and viscoelasticity, a reduction in erythrocyte membrane malondialdehyde (MDA) levels, and an increase in retinal capillary blood flow from 3.23 to 3.67 cm per minute⁽⁵⁾.

Other reported effects of ginkgo with potential benefits in diabetes include possible hypoglycaemic activity by the flavonoid fraction⁽⁶⁾, stimulation of pancreatic beta-cell function in type 2 diabetic subjects with pancreatic exhaustion⁽⁷⁾, and protection against oxidative renal injury^(8,9,10). Preliminary clinical reports associating regular use of oral or parenteral ginkgo with possible protective effects against diabetic retinopathy and nephropathy, have also been made by Polish and Chinese researchers during the past 2 years^(11,12).

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